

Course Title:	Stem: Grade 5
Grade(s):	Grade 5

Course Description
This Grade 5 STEM curriculum is designed to move students from passive learners to active problem solvers. By combining physical building with digital logic, students explore how engineering, math, and creativity intersect in the real world.
Approved Curricular Materials/Textbook(s)
Code Monkey VEX GO Robotics Tinkercad Bridges in Mathematics 3rd edition Qweebi Stop Motion Animation App

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Unit 1: Team Building/Engineering	Students use various materials to build, problem solve, and work together to solve challenges. Students will: - Cooperatively work with others to solve a problem - Collaborate, troubleshoot, and improve their work	4 weeks (August-September)
Unit 2: Coding	To round out the Grade 5 STEM curriculum, CodeMonkey acts as the bridge between visual "block" logic and professional text-based programming. It is a game-based platform where students solve puzzles by writing actual code to help a monkey collect bananas. There are over 200 challenges that cover statements, loops, and variables.	7 weeks (October-January)

	Students will: • Write real code and type commands in CoffeeScript • Solve logic puzzles by navigating a monkey through levels to retrieve bananas, using code to overcome obstacles like crocodiles, tigers, and moving platforms • Debug programs like when the monkey misses a banana, students must analyze their code, find the error (the "bug"), and fix it to progress	
Unit 3: Roller Coasters	Students begin this unit as Systems Engineers by using a virtual makerspace. They will design and stress-test roller coasters, collecting data on speed and energy to prove why their designs are both thrilling and safe. They finish the unit by using the engineering design process to make a model of a roller coaster that must safely get the marble to the bottom of the track. Students will: • Use a 3D canvas to "sketch" track designs. They move nodes in 3D space to create drops, camelbacks (hills), and loops. • Run simulations in real-time. If the coaster fails, they don't just "fix it"—they use the built-in sensors to find the exact point where the car's velocity dropped too low. • Learn about energy transformations like potential energy and kinetic energy, as well as gravity and G-force.	3 weeks (January-February)
Unit 4: VEX GO Robotics	The VEX GO Super Car lab is a foundational unit for Grade 5 students that bridges the gap between simple machines and complex vehicular engineering. In this lab, students move from building a basic unpowered car to a motorized "Super Car" that uses gear ratios to manipulate speed and torque. Students will: • Understand how wheel alignment and weight distribution affect how straight and far a vehicle travels • Observe how electrical energy is transformed into mechanical motion • Understand the trade-off between Speed and Torque (power)	5 weeks (February-April)
Unit 5: 3D Printing	In 5th Grade, 3D printing moves beyond simply making "cool shapes" to Functional Engineering. Students transition from using basic primitives to	5 weeks (February-April)

	designing complex, multi-part systems that solve specific problems. The focus shifts toward tolerances, moving parts, and slicing optimization. Students will: • Design separate parts that must fit together perfectly • Use "Smart Duplicate" to create complex patterns, gears, or structural lattices • Take a 2D drawing and "extrude" it into a 3D object	
Unit 6: Solar Design	Adapted Bridges in Mathematics Unit 8: In Grade 5 Bridges Math, Unit 8: Solar Design is the "Grand Finale" where students apply a full year of mathematical knowledge to an integrated STEM challenge. This unit shifts from abstract calculations to Applied Engineering, specifically focusing on the geometry and physics of solar energy. Students will: • Analyze temperature fluctuations over time • Manage a "Solar Credit" budget using decimals • Calculate the volume of complex 3D structures	5 weeks (May-June)